which we think the moſt ſolid ones, and appear ſo to our ſight, have notwithſtanding abundance of thoſe groſſer kind of pores, which will admit ſeveral kinds of liquors into them, why ſhould we not believe that Glaſs, and all other tranſparent bodies abound with them, ſince we have many other arguments, beſides the propagation of light, which ſeem to argue for it?

And whereas it may be objected, that the propagation of light is no argument that there are thoſe atomical pores in glaſs, ſince there are *Hypotheſes* plauſible enough to ſolve thoſe *Phænomena*, by ſuppoſing the pulſe onely to be communicated through the tranſparent body.

To this I anſwer, that that *Hypotheſis* which the induſtrious *Moreanus* has publiſh'd about the ſlower motion of the end of a Ray in a denſer *medium*, then in a more rare and thin, ſeems altogether unſufficient to ſolve abundance of *Phænomena*, of which this is not the leaſt conſiderable, that it is impoſſible from that ſuppoſition, that any colours ſhould be generated from the refraction of the Rays; for ſince by that *Hypotheſis* the *undulating pulſe* is always carried perpendicular, or at right angles with the Ray or Line of direction, it follows, that the ſtroke of the pulſe of light, after it has been once or twice refracted (through a Priſme, for example) muſt affect the eye with the ſame kind of ſtroke as if it had not been refracted at all. Nor will it be enough for a Defendant of that *Hypotheſis*, to ſay, that perhaps it is becauſe the refractions have made the Rays more weak, for if ſo, then two refractions in the two parallel ſides of a *Quadrangular Priſme* would produce colours, but we have no ſuch *Phænomena* produc'd.

There are ſeveral Arguments that I could bring to evince that there are in all tranſparent bodies ſuch atomical pores. And that there is ſuch a fluid body as I am arguing for, which is the *medium*, or Inſtrument, by which the pulſe of Light is convey'd from the *lucid body* to the enlightn'd. But that it being a digreſſion from the Obſervations I was recording, about the Pores of *Kettering Stone*, it would be too much ſuch, if I ſhould protract it too long; and therefore I ſhall proceed to the next *Obſervation*.

Obſerv. XVI. *Of* Charcoal, *or burnt* Vegetables.

CHarcoal, or a Vegetable burnt black, affords an object no leſs pleaſant than inſtructive; for if you take a ſmall round Charcoal, and break it ſhort with your fingers, you may perceive it to break with a very ſmooth and ſleek ſurface, almoſt like the ſurface of black ſealing Wax; this ſurface, if it be look'd on with an ordinary *Microſcope*, does manifeſt abundance of thoſe pores which are alſo viſible to the eye in many kinds of *Wood*, rang'd round the pith, both a in kind of circular order, and a radiant one. Of theſe there are a multitude in the ſubſtance of the Coal, every where almoſt perforating and drilling it from end to end; by means

means of which, be the Coal never ſo long, you may eaſily blow through it; and this you may preſently find, by wetting one end of it with Spittle, and blowing at the other.

But this is not all, for beſides thoſe many great and conſpicuous irregular ſpots or pores, if a better *Microſcope* be made uſe of, there will appear an infinite company of exceedingly ſmall, and very regular pores, ſo thick and ſo orderly ſet, and ſo cloſe to one another, that they leave very little room or ſpace between them to be fill'd with a ſolid body, for the apparent *interſtitia*, or ſeparating ſides of theſe pores ſeem ſo thin in ſome places, that the texture of a Honey-comb cannot be more porous. Though this be not every where ſo, the intercurrent partitions in ſome places being very much thicker in proportion to the holes.

Moſt of theſe ſmall pores ſeem'd to be pretty round, and were rang'd in rows that radiated from the pith to the bark; they all of them ſeem'd to be continued open pores, running the whole length of the Stick; and that they were all perforated, I try'd by breaking off a very thin ſliver of the Coal croſs-ways, and then with my *Microſcope*, diligently ſurveying them againſt the light, for by that means I was able to ſee quite through them.

Theſe pores were ſo exceeding ſmall and thick, that in a line of them, $\frac{1}{18}$ part of an Inch long, I found by numbring them no leſs then 150. ſmall pores; and therefore in a line of them an Inch long, muſt be no leſs then 2700. pores, and in a circular *area* of an Inch diameter, muſt be about 5725350. of the like pores; ſo that a Stick of an Inch Diameter, may containe no leſs then ſeven hundred and twenty five thonſand, beſides 5 Millions of pores, which would, I doubt not, ſeem even incredible, were not every one left to believe his own eyes. Nay, having ſince examin'd *Cocus*, *black and green Ebony*, *Lignum Vitæ*, &c. I found, that all theſe Woods have their pores, abundantly ſmaller then thoſe of ſoft light Wood; in ſo much, that thoſe of *Guajacum* ſeem'd not above an eighth part of the bigneſs of the pores of Beech, but then the *Interſtitia* were thicker; ſo prodigiouſly curious are the contrivances, pipes, or ſluces by which the *Succus nutritius*, or Juyce of a Vegetable is convey'd from place to place.

This *Obſervation* ſeems to afford us the true reaſon of ſeveral *Phænomena* of Coals; as

Firſt, why they look black; and for this we need go no further then the *Scheme*, for certainly, a body that has ſo many pores in it as this is diſcover'd to have, from each of which no light is reflected, muſt neceſſarily look black, eſpecially, when the pores are ſomewhat bigger in proportion to the intervals then they are cut in the *Scheme*, black being nothing elſe but a privation of Light, or a want of reflection; and whereſoever this reflecting quality is deficient, there does that part look black, whether it be from a porouſneſs of the body, as in this Inſtance, or in a deadning and dulling quality, ſuch as I have obſerv'd in the *Scoria* of Lead, Tin, Silver, Copper, *&c.*

Next, we may alſo as plainly ſee the reaſon of its ſhining quality, and

that